

Development of a 352 MHz, low- β superconducting reentrant cavity at LNL

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A superconducting reentrant cavity for low beta beams has been designed, built and tested at LNL after chemical polishing at CERN. This single gap resonator is a prototype for the low beta section of the TRASCO 30 mA proton linac, designed aiming at full beam transmission even in case of failure of one resonator. This 352 MHz single-gap cavity can be used at low energy down to $\beta=0.1$. An important feature of the mechanical design is the double-wall structure, allowing light weight and stability against helium pressure in spite of the large flat shape. The resonator internal profile was designed to prevent multipacting. The cavity was tested at 4.2 K, showing high gradient (7.5 MV/m at the nominal 7 W power) and no dangerous multipacting. For their compact size, field symmetry, wide velocity acceptance and low peak fields, reentrant cavities can play an important role in special applications of low- β linacs.